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odon callichrous, *Plagiochila punctata*, *Adelanthus decipiens*, *Bazzania trilobata*, and *B. tricrenata*, deep masses of *Plagiochila spinulosa*, and isolated stems of *Hylocomium umbratum*. It is on such shady rocks as this that *Saccogyna viticulosa* fruits. The plant occurs in a fine patch on the rocks shown, but is sterile. It fruits, however, in the district. Lower down the valley great cushions of *Sphagnum* strike the attention, chiefly *S. rubellum* and *S. molluscum*. *Leucobryum glaucum*, everywhere common in North Wales, is here found fruiting; and on the trunks of the conifers yellowish patches may be seen, which are formed by *Microlejeunea ulicina*. *Breutelia* is abundant, and Mr. Jones pointed out fruiting specimens, on a wall near the ravine.

Should any bryologist wish to study the Atlantic bryophytic flora at first hand, he could hardly do better than make a stay at Harlech, where he will receive a welcome and every assistance from Mr. Jones.

EDGBASTON, BIRMINGHAM, ENGLAND, 11 OCT. 1915.

ADDITIONS TO THE HEPATIC FLORA OF QUEBEC[1]

ALEXANDER W. EVANS

In the seventh part of Professor John Macoun's Catalogue of Canadian Plants, published at Ottawa, in 1902, sixty-three species of Hepaticae are recorded from the province of Quebec. They are the following: *Riccia arvensis*, *Ricciella fluitans* (listed as *Riccia fluitans*), *Ricciocarpus natans* (listed under the variety *terrestris*), *Neesiella rupestris* (listed as *Grimaldia rupestris*), *Conocephalum conicum*, *Preissia quadrata* (listed as *Cyathophora quadrata*), *Marchantia polymorpha*, *Riccardia latifrons* (listed as *Aneura latifrons*), *R. pinguis* (listed as *A. pinguis*), *Metzgeria myriopoda*, *Pellia epiphylla*, *Blasia pusilla*, *Fossombronia foveolata*, *Jungermannia cordifolia*, *J. pumila*, *Jamesoniella autumnalis* (listed as *Jungermannia autumnalis*), *Lophozia alpestris*, *L. attenuata*, *L. barbata*, *L. incisa*, *L. inflata*, *L. longiflora* (listed as *L. ventricosa*, var. *longiflora*), *L. Muelleri*, *L. porphyroleuca* (listed as *L. ventricosa*, var. *porphyroleuca*), *I. quinquedentata*, *L. ventricosa*, *Sphenolobus exsectus* (listed as *L. exsecta*), *S. Michauxii* (listed as *L. Michauxii*), *S. politus* (listed as *L. polita*), *S. saxicola* (listed as *L. saxicola*), *S. scitulus* (listed as *L. exsecta*, var. "*scituta*"), *Plagiochila asplenioides*, *Mylia anomala*, *M. Taylori*, *Lophocolea heterophylla* (listed also as *L. Macounii*), *Chiloscyphus rivularis* (listed as *Ch. polyanthos*, var. *rivularis*), *Geocalyx graveolens*, *Cephalozia bicuspidata*, *C. catenulata*, *C. curvifolia*, *C. fluitans*, *C. media*, *Calypogeia Trichomanis* (listed as *Kantia Trichomanis*), *Bazzania trilobata*, *Lepidozia reptans*, *Blepharostoma trichophyllum*, *Temnoma setiforme* (listed as *Blepharostoma setiforme*), *Ptilidium ciliare*, *Pt. pulcherrimum*, *Trichocolea tomentella*, *Diplophyllum taxifolium* (listed as *Diplophylleia taxifolia*), *Scapania curta*, *S. glaucocephala*, *S. irrigua*, *S. nemorosa*, *S. undulata*, *Radula complanata*, *Porella platyphylla*, *Lejeunea cavifolia*, *Frullania Asagrayana*, *F. eboracensis*, *F. Selwyniana*, and *Anthoceros Macounii*. There are perhaps eight species in this list of which the writer has seen no material from Quebec.

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[1] Contribution from the Osborn Botanical Laboratory.

Only four of these, however, can be considered at all doubtful. One is *Metzgeria myriopoda*, a species with a decidedly southern range; the others are *Lophozia longiflora*, *L. Muelleri*, and *Sphenolobus scitulus*. A re-examination of Macoun's specimens of these four species is much to be desired. Since the publication of Macoun's Catalogue important collections of Quebec hepatics have been made, not only by Professor Macoun himself, but by Professor J. F. Collins, Rev. H. Dupret, Brother Victorin, and the writer. Another collection was made by Mr. J. A. Allen as long ago as 1881 but was not studied by Professor Macoun. These collections add forty-one species to those listed by Macoun. Five of the most interesting of these additions, *Clevea hyalina*, *Neesiella pilosa*, *Lophozia badensis*, *L. Hatcheri* (= *L. Baueriana*), and *Frullania Bolanderi*,[1] have already been recorded, and it is the purpose of the present paper to call attention to the others. The species are arranged according to Schiffner's system in Engler & Prantl's "Die natürlichen Pflanzenfamilien," and the only dates given are those of the earliest collections. The additions increase the total number of species known from Quebec to 104, or if the four doubtful species listed by Macoun are omitted, to 100.

1. METZGERIA FURCATA (L.) Dumort. On rocks. St. Hilaire Mountains, *Brother Victorin 30*, August, 1910; Bic, *A. W. E. 116, 125, 139, 140*.

2. PELLIA NEESIANA (Gottsche) Limpr. In bogs and on moist rocks. St. Hubert, *Brother Victorin 23*, May, 1913; Bic, *A. W. E. 146*.

3. GYMNOMITRIUM CONCINNATUM (Lightf.) Nees. On rocks. Bic, *J. F. Collins 3262*, July, 1904; *A. W. E. 173;* Table-top Mountain, *J. F. Collins 4311b*.

4. GYMNOMITRIUM CORALLIOIDES Nees. On rocks. Bic, *A. W. E. 124, 127, 174*, August, 1915.

5. MARSUPELLA SULLIVANTII (DeNot.) Evans. On moist rocks. Table-top Mountain, *J. F. Collins 4389, 4489*, August, 1906.

6. NARDIA CRENULATA (Sm.) Lindb. On sandy banks. Longueuil, *Brother Victorin 23*, July, 1910.

7. JUNGERMANNIA LANCEOLATA L. On shaded banks and rotten logs. Tadousac, *A. W. E. 16, 59*, July, 1915; Bic, *A. W. E. 137*.

8. LOPHOZIA BICRENATA (Schmid.) Dumort. On shaded earth. Salmon River, *J. Macoun 8*, July, 1905; Tadousac, *A. W. E. 13, 15*.

9. LOPHOZIA CONFERTIFOLIA Schiffn. On earth among rocks. Bic, *A. W. E. 165*, August, 1915.

10. LOPHOZIA EXCISA (Dicks.) Dumort. On shaded earth. Tadousac, *A. W. E. 14*, July, 1915.

11. LOPHOZIA FLOERKII (Web. f. & Mohr) Schiffn. On rocks. Table-top Mountain, *J. F. Collins 4387a, 4390, 4396a, 4490a*, August, 1916.

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[1] See Evans, Rhodora **16:** 63. 1914 (for *Clevea hyalina*, the record being based on specimens collected by O. D. Allen on Mt. Albert, in July, 1881); BRYOLOGIST **14:** 84. 1911 (for *Neesiella pilosa*); ibid. **13:** 34. 1910 (for *Lophozia badensis*); ibid. **18:** 72. 1915 (for *Frullania Bolanderi*); also Conklin, BRYOLOGIST **15:** 12. 1912 (for *Lophozia Hatcheri*).

12. Lophozia heterocolpa (Thed.) M. A. Howe. On shaded banks and rotten logs in calcareous regions. Bic, *A. W. E. 99, 108, 109, 149, 150,* August, 1915.

13. Lophozia Kaurini (Limpr.) Steph. On moist calcareous rocks. Between Baldé and Baie des Chaleurs, Bonaventure River, *J. F. Collins 3540, 3584,* August, 1904.

14. Lophozia Kunzeana (Hüben.) Evans. On rocks. Mt. Albert, *J. F. Collins 4055c, 4083b,* July, 1906; Rigaud, *H. Dupret 7.*

15. Lophozia longidens (Lindb.) Macoun. On rocks. Tadousac, *A. W. E. 8, 80,* July, 1915; Bic, *A. W. E. 147.*

16. Lophozia lycopodioides (Wallr.) Cogn. On shaded rocks and earth. Mt. Albert, *J. F. Collins 4143,* July 1906; Table-top Mountain, *J. F. Collins 4387c, 4547, 4552, 4576a;* Bic, *A. W. E. 158, 159.*

17. Sphenolobus exsectaeformis (Breidl.) Steph. On shaded rocks, earth, and rotten logs. Sandy Bay, *J. F. Collins 4703,* August, 1906; Tadousac, *A. W. E. 5, 42;* Bic, *A. W. E. 92, 132, 151, 154.*

18. Sphenolobus Hellerianus (Nees) Steph. On rotten logs. Trail to Table-top Mountain, *J. F Collins 4259a,* July, 1906; Bic, *A. W. E. 161.*

19. Sphenolobus minutus (Crantz) Steph. On rocks. Ste. Anne des Monts River, *J. A. Allen 3,* July, 1881; *J. F. Collins 4616;* Table-top Mountain, *J. F. Collins 4784a;* St. Columbin, *Brother Victorin 17;* Tadousac, *A. W. E. 10, 68;* Bic, *A. W. E. 128, 142.*

20. Lophocolea minor Nees. On shaded rocks and banks. Montreal, *H. Dupret 13, 41,* November, 1906; Isle d'Orleans, *A. W. E. 1;* Tadousac, *A. W. E. 41;* Bic, *A. W. E. 97, 105.*

21. Chiloscyphus fragilis (Roth) Schiffn. In pools. Oka, *H. Dupret, 19,* July, 1904; Grand River, *J. F. Collins 3665.*

22. Chiloscyphus pallescens (Ehrh.) Dumort. On rotten logs. Tadousac, *A. W. E. 18,* July, 1915.

23. Harpanthus scutatus (Web. f. & Mohr) Spruce. On rotten logs. Tadousac, *A. W. E. 26,* July, 1915.

24. Cephaloziella byssacea (Roth) Warnst. On rocks and earth. Tadousac, *A. W. E. 49, 52 56,* July, 1915; Bic, *A. W. E. 168.*

25. Cephaloziella Hampeana (Nees) Schiffn. On rocks and earth. Bic, *J. F. Collins 4857,* July, 1907; Tadousac, *A. W. E. 45.*

26. Cephaloziella myriantha (Lindb.) Schiffn. On earth. Tadousac, *A. W. E. 61,* July, 1915; Bic, *A. W. E. 110.*

27. Odontoschisma denudatum (Mart.) Dumort. On rotten logs. Montmorency River, *J. Macoun 10,* July, 1905.

28. Calypogeia Neesiana (Massal. & Carest.) K. Müll. On shaded earth. Bic, *J. F. Collins 5057,* July, 1907; Oka, *H. Dupret 42, 48.*

29. Calypogeia suecica (Arn. & Perss.) K. Müll On rotten logs. Ste. Anne des Monts River, *J. F. Collins 4622,* August, 1906.

30. Bazzania tricrenata (Wahl.) Trevis. On rocks. Mt. Albert, *J. A. Allen 27,* July, 1881; *J. F. Collins 4202;* Percé, *J. F. Collins 3728a.*

31. SCAPANIA PALUDICOLA Kaalaas & K. Müll. In peat bogs. St. Hubert, *Brother Victorin 1, 22*, August, 1909.

32. SCAPANIA SUBALPINA (Nees) Dumort. On rocks. Table-top Mountain, *J. F. Collins 4487*, August, 1906.

33. SCAPANIA UMBROSA (Schrad.) Dumort. On rotten logs. Tadousac, *A. W. E. 24, July, 1915*.

34. PORELLA PINNATA L. In running water. Montmorency River, *J. Macoun 7*, June, 1905.

35. FRULLANIA OAKESIANA Aust. On trees and rocks. Seal Cove River, Douglastown, *J. F. Collins 3797*, August, 1904; Tadousac, *A. W. E. 74, 75*.

If the four doubtful species in Macoun's Catalogue are excluded it will be seen that all the Quebec species occur also in New England, with the exception of the following three: *Sphenolobus politus*, *S. saxicola*, and *Frullania Bolanderi*. It is probable, in fact, that most of the other species now known from Maine, New Hampshire, and Vermont await discovery in Quebec. Whether the more northern types, known from Arctic America, Yukon, and Alaska, are likewise to be expected is, of course, uncertain. The occurrence of such species as *Gymnomitrium concinnatum* and *G. corallioides* at Bic, almost at the sea level, is perhaps an indication that other alpine and artic forms may reach the shores of the St. Lawrence nearer its mouth, but there is no definite evidence as yet to support this idea. According to our present information no exclusively arctic types are known from Quebec, and its hepatic flora might be described as north temperate in character.

When compared with the flora of Europe the only distinctive elements are the five species of *Frullania*, *F. Asagrayana*, *F. Bolanderi*, *F. eboracensis*, *F. Oakesiana*, and *F. Selwyniana;* and the known range of *F. Bolanderi*, as has recently been noted, stretches across North America to the Pacific Coast with an extension to the island of Saghalin in eastern Asia. Possibly the high ratio of endemic species in *Frullania* is associated with the fact that the genus is apparently tropical in origin and comparatively modern.

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DR. HERMANN EDWARD HASSE

CHARLES C. PLITT

In the death of Dr. Hasse, October 29, 1915, lichenology has lost one of its ablest, most enthusiastic, scholarly, and conscientious workers. He was born January 12, 1836, in Freiburg, Saxony. At the age of 9 years he emigrated with his parents to Milwaukee, Wisconsin, where they established their home. Political discontent was the cause of the emigration. The father, Judge Carl E. Hasse, brought with him a fine library, and the boy grew up in an atmosphere of intelligence. He received his education in the public school. Later, having